PBDE Deca-Alternatives Advisory Committee
Meeting #3 Notes
November 16, 2005

The third and final meeting of the PBDE Deca-Alternatives Advisory Committee was held on November 16, 2005 at the Landmark Convention Center in Tacoma, Washington. A copy of the meeting agenda is included in Attachment 1*.

The following advisory committee members attended the meeting:

Dave Sanders, Bromine Science and Environmental Forum
Ivy Sager-Rosenthal, Toxic-Free Legacy Coalition
Dale Swanson, Panasonic Shikoku
Laurie Valeriano, Washington Toxics Coalition
Craig Lorch, Total Reclaim
Grant Nelson, Association of Washington Businesses
Gary Smith, Independent Business Association
Sego Jackson, Snohomish County Solid Waste Management Division
Heather Trim, People for Puget Sound

Ecology and Health staff presenting information during the meeting:

Carol Kraege, Department of Ecology
Denise Laflamme, Department of Health
Rob Duff, Department of Health

Representatives from government agencies who attended the meeting:

Mike Gallagher, Department of Ecology
Greg Sorlie, Department of Ecology
Ted Sturdevant, Department of Ecology
Lynn Geller, Department of Ecology
Erin Wallace, Department of Health
Jan Haywood, Department of Ecology
Steve Whittaker, Department of Labor and Industries

Additional stakeholders and members of the public who attended the meeting:

Susan Landry, Bromine Science and Environmental Forum
Earl Tower, Bromine Science and Environmental Forum

Marc Daudon facilitated the meeting and Nanda Blazej took notes.

Convene and Introductions

Marc Daudon welcomed the advisory committee members and members of the public to the third and final meeting of the PBDE Deca-alternatives advisory committee. Advisory committee members, representatives of government agencies, and additional attendees introduced themselves and briefly stated their affiliations.

Marc reviewed the meeting agenda, process guidelines and ground rules that have been used throughout all advisory committee meetings. He reminded everyone to be respectful,

turn off cell phones, and not interrupt when others are speaking. He also reiterated that members would speak first and that other attendees would be recognized as time allowed. Marc explained that there were three things to accomplish in the third meeting:

1) To share additional information on Deca alternatives that Health had received since the previous meeting;
2) To hear from Ecology about their summary findings and recommendations for addressing the Deca ban issue; and
3) To identify the components of the final PBDE Chemical Action Plan (CAP) that will be put out for public comment.

Ecology and Health have been working very hard to complete the CAP. Marc acknowledged the short turnaround time between the last meeting, which was held on October 25, 2005, and this final meeting.

Deca Alternatives Research Update

Denise Laflamme gave an update on additional information that had been received since Health's first presentation to the committee, (October 25, 2005), on their assessment of Deca alternatives. (Attachment 2*). She thanked everyone for sending in their additional information and comments over the past few weeks. Denise reviewed the additional information that she had received. One committee member submitted information on alternative flame retardants that Panasonic is using or considering using in their manufacturing processes. Another committee member sent Denise clarifications on the use of flame retardants in different polymers. Additional information provided by Clariant showed that all of Health's identified Deca alternatives can indeed be used in High-impact polystyrene (HIPS).

Denise also received new, helpful information on Resorcinol bis (diphenylphosphate) (RDP) and Bisphenol A diphosphate (BAPP). Akzo Nobel gave Health the octanol-water partition coefficient (K_{ow}) for RDP, which is lower than originally thought, thus indicating a lower potential for bioaccumulation. Ecology's bioaccumulation criteria, which was set according to their draft persistent, bioaccumulative toxins (PBT) rule, is that a chemical has a bioconcentration factor (BCF) that is greater than 1000 or a K_{ow} that is greater than 5. In light of the new data for RDP, its K_{ow} does not characterize the chemical as bioaccumulative according to Ecology's standards. For persistence information, Ecology looks at half-life.

Ecology has contracted with Syracuse Research Group to provide modeling information to help fill in the gaps that remain in the alternatives assessment of RDP. Denise stated that Health's conclusions from the first round of the alternatives assessment are essentially unchanged. Health has not identified any clear Deca alternatives that have lower toxicity, lower persistence and lower bioaccumulation potential. Several chemicals look promising, but there is not sufficient information to establish this now. Health will continue to look for toxicity studies and information on Deca alternatives.

Advisory committee members had the following questions and comments on the Deca alternatives research update:

- **Can Health say that phosphates in general are less bioaccumulative than Deca or other alternatives?** Health responded that, with the information they have, they can only say that Bisphenol A bis(diphenyl phosphate) (BDP) is less bioaccumulative than other Deca alternatives.
- **Conversation around Ecology's role in identifying alternatives to Deca.** Committee members discussed Ecology's role as it pertains to identifying and sharing Deca alternatives information. One member commented that Ecology's role is to

look at alternatives that are out there and say which ones look less toxic. Ecology does not have to tell companies which alternatives they should use. Health responded that they and Ecology need to determine how much data they require in order to make a decision such as a ban. They do not have set criteria for measuring safety of alternatives other than persistence, bioaccumulation and toxicity. Ecology and Health do not currently have enough toxicity data for Deca or Deca alternatives.

- **Act on the information Ecology has now.** One committee member stated that Ecology needs to act now on the information they already have. She claimed that there is conclusive evidence that PBDEs are in humans and the environment and that Ecology cannot afford to wait for more data on the safest alternative(s). Health responded that they still need to gather more information on Deca's toxicity which will then make it easier to identify a safer alternative. There are still many questions surrounding Deca's toxicity and contribution to environmental and health problems. Ecology may be moving in the direction of banning Deca, but they are not there yet.
- **The bioconcentration factor for Deca is lower than for other alternatives.** One committee member pointed out that Deca's BCF appears dramatically lower than the BCFs for Deca alternatives.
- **What is the role of Antimony trioxide?** One committee member mentioned that Antimony trioxide is used in conjunction with Deca and other flame retardants, not as an alternative. Given this pairing, the committee member asked Health and Ecology if they would then look at Antimony trioxide's K_{ow} and BCF numbers together with the numbers for Deca or the alternative. One committee member asked if Antimony Trioxide is always used in conjunction with Deca, and another member responded, "Yes, for the most part."

Deca Alternatives - Summary Findings & Draft Recommendations

Carol Kraege and Rob Duff summarized Ecology's and Health's conclusions to-date and then presented their recommendations for dealing with Deca. (Attachment 3*). Carol began by reviewing the history of the Deca advisory committee and the interim CAP process. A year ago, the interim CAP charged Ecology and Health, in consultation with stakeholders, to develop a proposal for a ban on appropriate products containing Deca by December 2005. The goal was to maximize benefits of a ban while minimizing impacts on manufacturers, retailers and consumers, and ensuring adequate fire protection. The interim CAP directed Ecology and Health to:

- Determine types of products that would be covered by a ban;
- Evaluate human health, environmental and economic impacts;
- Investigate alternative materials, product design changes and chemicals that meet fire safety standards;
- Investigate impacts on fire safety;
- Investigate impacts on retailers and consumers;
- Examine exemption processes; and
- Continue to monitor emerging information.

Carol explained that they have not looked at product redesign or exemption processes that might be part of a ban. They did however, identify electronic enclosures as the products to focus on during the current advisory process. There are numerous other products that contain Deca that Ecology and Health chose not to address at this time. Carol proceeded to review the PBDE Deca-Alternatives Advisory Committee process. In July 2005, Ecology and Health reconvened stakeholders. Health conducted the alternatives assessment, Ecology conducted the cost-benefit analysis, and both agencies tracked emerging information on Deca degradation and alternatives. Carol then reviewed the findings from both the alternatives assessment and the cost-benefit analysis. In its alternatives assessment,

Health concluded that alternatives to Deca are available and feasible for use in HIPS and HIPs/polyphenylene oxide (PPO); that several alternatives look promising but that a clearly safer alternative has not yet been identified; and that persistence, bioaccumulation and toxicity data are lacking for Deca alternatives. In its cost-benefit analysis, Ecology concluded that it is difficult to define costs and benefits because of large data gaps and uncertainties. Conservative estimates indicate net benefits from a Deca ban if a benign alternative is available, but overall, Ecology concluded that the utility of a cost-benefit analysis is limited in this context.

Carol and Rob then reviewed Ecology's and Health's conclusions regarding Deca degradation. The agencies have concluded that Deca does breakdown via UV radiation and biological activity, and that it will continue to be a source of lower congeners for some time. If more data is collected that shows Deca is more toxic, persistent or bioaccumulative than their research shows now, then Ecology and Health will go forward with a ban. If a ban is implemented, then time will be given to manufacturers to identify or develop safer alternatives or design changes that preclude the need for Deca. Carol and Rob reviewed Ecology's and Health's recommendations regarding Deca and Deca alternatives:

1) The legislature should ban Deca in electronic enclosures provided that safer alternatives are found or with additional evidence of harm from Deca.
2) Ecology and Health should evaluate a ban on Deca in other products such as textiles and mattresses.
3) The legislature should provide necessary funding to Ecology and Health for:
    - Continued evaluation of emerging data
    - Independent modeling of toxicity of alternatives
    - Environmental/biomonitoring efforts

Advisory committee members had the following comments and questions on the Deca alternatives summary findings and draft recommendations:

- **To what degree does Deca breakdown in sunlight?** One committee member asked, in regards to Health's and Ecology's summary findings, to what degree Deca breaks down in sunlight (UV radiation). Ecology responded that they do not know how long Deca takes to breakdown through sunlight and biological processes, but that they have determined that Deca breaks down and will continue to be a source of lower congeners for some time. A committee member asked if Deca breaks down through other means other than sunlight exposure. Health responded that yes, Deca also has been shown to break down in anaerobic conditions.
- **Disagreement on how Deca breaks down in the environment.** One committee member disagreed with the conclusion that Deca breaks down into lower congeners. He said that there is no evidence that this breakdown occurs in the environment. An Ecology representative asked this committee member if "he had a position on what happens to Deca when it breaks down." The committee member responded that the bulk of Deca is contained within plastic and does not come out or evaporate. He explained that most likely, an abrasion on plastic that contains Deca can produce dust. He also stated that the bulk of Deca in the environment is not available to sunlight or anaerobic conditions. The committee member said that there are numerous studies that show that Deca does not degrade into components of Penta in the environment. He explained that in anaerobic degradation, a certain bromine comes off first. That particular bromine is found in all components of Penta that are found in the environment. In that case, it is very difficult to determine if components come from Deca or another source. Another committee member asked why researchers are finding Deca in breast milk, blood and food if the other member's statements are true that Deca does not break down in the environment.

She expressed concern specifically about the rising amounts of 153 and 154, (commercial components of Octa), in humans. The committee member said he could not respond specifically to concerns about 153 and 154, but that there are numerous articles that state there are a variety of PBDEs that are found in the natural environment. Another committee member responded that researchers have seen an increase in Deca in orca whales, which does not fit well with the other member's statement that Deca has always been found in the natural environment. The committee member responded that he debates the research that shows an increase in Deca in orca whales.

- **Clarification on the second recommendation regarding the evaluation of a ban on other Deca-containing products such as textiles and mattresses.** One committee member asked for Ecology to explain its second recommendation regarding textiles and mattresses. Ecology responded that they initially chose to focus specifically on electronic enclosures in the CAP process although they recognized that Deca can be used in other products as well. The Consumer Products Safety Commission (CPSC) has indicated that Deca would be a reasonable fire retardant in textiles and mattresses, which is why Ecology is recommending an evaluation of a ban on Deca in products such as textiles and mattresses. A committee member asked if Ecology envisions a similar stakeholder process for textiles and mattresses like the current one regarding electronic enclosures. Ecology responded that their recommendation simply acknowledges that Deca is used elsewhere; they have not yet determined how to move forward.
- **Differentiate between risk to humans and animals.** One committee member commented that there should be some process for determining the difference between risk from PBDEs to humans and animals. Health responded that they know that PBDEs are found in dust but that they do not know exactly how they are getting into the dust. It is also unclear how PBDEs are getting into animals, especially since orca whales for example, do not typically come into contact with dust. It appears that, for the first time, a PBT has an indoor pathway that is significant. Most PBT exposures have been almost entirely from the food chain, such as mercury and dioxin. However, it is still unclear how PBDEs are getting into the dust.
- **Acknowledgement of the narrow scope of the Deca alternatives process**. One committee member expressed concern with the limited scope of the Deca alternatives process. Health responded that they intentionally limited the scope from the beginning because they had access to already-conducted evaluations and research on Deca in electronics to use in their own assessments.
- **The role of paint on electronic enclosures.** One committee member mentioned that most electronic enclosures are painted and that the paint might help decrease the chance of Deca-containing dust from breaking off into the environment. He explained that it is difficult to look at an electronic device and know whether it is painted or not.
- **Deca in rigid versus softer plastics.** A committee member observed that rigid plastics would appear to break down less than softer plastics, so that PBDE dust may be a bigger issue with softer plastics. He stated that in the average home, there are numerous items that have PBDE-containing foam, such as couches, carpets, chairs, and mattresses. Another committee member mentioned that Deca specifically is not used in foam but that multiple studies have found Deca in homes, which would indicate that Deca gets into the homes through other means. A committee member shared results from a study where samples were swiped from computers and other items in a home and the highest levels of PBDEs were found on computers. Health responded that, as a public health agency, they have to consider bioaccumulative effects. They cannot put blinders on and say that electronics are the only route of exposure.

- **Have Ecology and Health researched people who do not have electronics in their home?** Health responded that it is a good point to make sure they have adequate control samples when conducting future biomonitoring studies. Health is not sure that they will be able to identify populations that do not have exposure to Deca, but they will definitely look for those populations.
- **Combine the first two recommendations.** A committee member suggested that Ecology and Health combine the first two recommendations into one so that it reads, "the legislature should ban Deca in electronic enclosures *and* other products such as textiles and mattresses." He stated that if Health and Ecology have concluded that Deca is a problem in and of itself, then they should deal with Deca for *all* products together, not separately as the recommendations currently read. Multiple committee members agreed. Another committee member commented that electronics are important because of the sheer number in existence. She also stated that she thinks it is important that a ban be set for all materials that may include Deca so as to motivate manufacturers to look for alternatives. Health and Ecology will present a more consistent message if they recommend a ban for all products containing Deca. Health responded that one of the reasons they separated electronics exposures from textiles in their recommendations was because electronics represent 80% of the use of Deca. Health also had access to a wealth of information on Deca in electronics as a basis to form their own assessments. In contrast, there is very little available data on Deca in textiles. The lack of information on Deca in textiles does not mean that textiles are not a significant pathway of exposure. One committee member commented that Deca has been evaluated in textiles and that researchers found Deca's value far exceeded any potential risk. Another committee member disagreed with this research.
- **If there is no alternative for Deca in flame retardants, how can Health and Ecology ban Deca?** Health responded that they will not sacrifice fire-protection standards.
- **Does "safer alternatives" refer to toxicity or flame retardancy?** Health responded that they are looking at alternatives that have lower toxicity than Deca. They still need more data on toxicity of alternatives. Health reiterated that when they say "safer," they are referring to toxicity. They will clarify that term in the recommendations.
- **Change the first recommendation to read, "*If* safer alternatives are found, *then* the legislature should ban Deca."** A committee member suggested that Ecology and Health rewrite their first recommendation into an if/then format. Another committee member agreed. Health reiterated that they will ban Deca if safer alternatives are found. He also explained that Health and Ecology will not rewrite their recommendations to water down concerns about Deca. Another committee member commented that companies will not move towards alternatives if Deca is not banned. Companies need the ban as an incentive to change.
- **Fire-retardants in clothing.** One committee member commented that the fire-retardant issue is important. He stated that there are now costumes available that do not have flame retardants in them. Another committee member clarified that Penta and Octa are not used in clothing except in firemen and steelworkers' protection gear. PBDEs are not used in clothing. Health reiterated that Ecology and Health will not sacrifice fire safety.
- **Balance between two risks: fire and PBDEs.** One committee member stated that the committee is talking about two risks: fire risk versus human health risk from PBDEs. If PBDEs are banned, then the fire risk remains. He commented that this imbalance in risks creates an inability for Health and Ecology to simply go forward with a ban. He agreed with the rewording of the first recommendation to be in an

if/then format. Health responded that if they go forward with a ban on Deca, flame-retardancy standards would not be sacrificed.

- **Disagreement about significance of Deca levels.** One committee member asked everyone to keep the levels of Deca in perspective. He commented that levels are parts per trillion and not significant. Another committee member argued that Deca levels are indeed significant if they are put in perspective with all of the other chemicals that are found in human bodies. She stated that we cannot look at one chemical at a time; we know Deca is harmful and it needs to be eliminated.
- **Why is the committee reviewing Ecology's and Health's recommendations?** One committee member asked what the point is of having the committee look at Ecology's and Health's recommendations. Health responded that they want feedback on how to word the recommendations, etc. They are hearing that they need to clarify the first recommendation. The facilitator reiterated that Ecology and Health want to hear all discussions and comments before they put out their recommendations for public comment.
- **Support for third recommendation.** One committee member stated that Ecology and Health definitely need to do further research and/or conduct studies in order to strengthen their data on Deca and Deca alternatives. He supports the third recommendation.
- **Recommendation to ban electronic enclosures with a future phase-out date.** One committee member suggested that Health and Ecology ban Deca in electronic enclosures only and that they incorporate a future phase-out date. Another committee member disagreed with the phase-out date. He said that if chemical companies are forced to change their processes in a certain timeframe then they may be forced to use alternatives that have not been studied thoroughly enough simply because they would be crunched for time.
- **Encourage companies to look for less-toxic alternatives**. One committee member asked Ecology and Health to add to their recommendations that companies are encouraged to look for less-toxic alternatives to Deca. Another committee member asked if Health and Ecology could add the phrase, "and industries must utilize safer alternatives" to the first recommendation. Ecology responded that adding that phrase would put Ecology in the position of having to approve what alternatives a company decides to use. He explained that that would be impossible for Ecology to do. Another committee member added that the committee is not asking Ecology and Health to regulate alternatives, just to continue evaluating them.
- **Continue researching Deca sources and relative mobility**. In response to the third recommendation, one committee member said that he would like Health and Ecology to continue researching sources of where Deca comes from and its relative mobility.
- **Discussion about the relationship between this Deca alternatives process and the End-of-Life (EOL) process.** One committee member commented that he does not think the Deca alternatives process can be completed without feedback from the EOL process, which has not yet begun. He stated that the two processes are integrally connected and need to be considered together. Ecology stated that the current recommendations do not hinge on EOL outcomes. The committee member replied that, since there is no agreement on the degradation and toxicity of Deca, and that Ecology cannot yet identify safer alternatives, then Ecology and Health need to pause before banning anything. He reiterated that it does not make sense to continue with a ban without discussing the entire life cycle of Deca-containing products. Ecology asked the committee to remember that they are coming up with an "action plan." Ecology and Health will continue to gather data and focus on the PBDE issue. They do not have to finalize all steps in order to come out with their action plan. Health responded that perhaps the EOL issue is more

important when someone does not agree that Deca is a problem. The disconnect may be stemming from the fact that Ecology and Health have concluded that Deca *is* a problem. Another committee member stated that he thinks it is important to keep the issues of a front-end ban and EOL separate. Combining efforts may just be too confusing.

- **Why have Ecology and Health concluded that Deca is a problem?** A committee member asked what Ecology and Health are "hanging on to" that has led them to a completely different decision than the European Union's (EU) findings regarding Deca. Health responded that they are relying on debromination findings, which were only available to the EU in the final stages of their decision-making process. Ecology added that they are not making their decisions based on what the EU did or did not do. The more Ecology studies Deca and Deca alternatives, the more they realize that there will always be more to know. There may always be a reason to wait for more information, so it is a judgment call as to when they have to make decisions. Ecology does not feel as though the process has been rushed or that there is a good reason to combine the current conversations with the EOL process.

Based on the feedback and questions from the advisory committee's conversations, the facilitator summarized the suggestions for Ecology and Health regarding their draft recommendations:

First recommendation

- Change the first recommendation into an if/then statement: "If safer alternatives are found, then the legislature should ban Deca in electronic enclosures."
- Include a future phase-out date in the ban so as to pressure industry to move forward to find alternatives.
- Ban Deca and eliminate the reference to "safer alternatives."

Second recommendation

- Merge the first and second recommendations to combine textiles and mattresses with electronic enclosures in the proposed ban. It is more consistent to ban *all* products that contain Deca.

Third recommendation

- Widespread support for the third recommendation.
- Include further research on where Deca is found and how it moves.

Clarification

- Clarify what is meant by "safer" alternatives.
- Clarify that fire safety standards will be upheld.

Additional suggestions

- Add recommendation to encourage industries to use least-toxic alternatives.
- Wait until the End-of-Life process is concluded before finalizing any recommendations.

Final PBDE Chemical Action Plan Recommendations

Carol Kraege presented the final PBDE CAP recommendations. (Attachment 3*). She reiterated that Ecology's and Health's three recommendations from the previous section are just focused on Deca and that now she would like the committee to look at the recommendations for *all* PBDEs in the final CAP. The recommendations are organized according to the structure of the interim plan, which addressed source control, End-of-Life,

U.S. Chemical Policy, minimizing human exposure, and monitoring and research. Carol reviewed each of the final PBDE CAP recommendations:

Source Control

- The Washington State legislature should ban the manufacture, distribution (but not transshipment) or sale of new products containing Penta and Octa in Washington.
- The Washington state legislature should ban Deca in electronic enclosures providing safer alternatives are identified or with additional evidence of Deca harm.
- Ecology and Health should evaluate a ban on Deca in other products such as textiles and mattresses.

End-of-Life

- Ecology should establish a process to evaluate and determine appropriate disposal and recycling practices for products containing PBDEs, including potential financing options.
- Ecology should involve appropriate stakeholders in this process.
- Carol added that Ecology has prepared a list of people they think would be interested in participating in the EOL process. They will send an invitation letter in November to get the process started. She expects that meetings will begin in early 2006.

U.S. Chemical Policy

- Ecology and Health should actively seek opportunities to work with other states and interested parties to contribute to the national dialogue regarding needed improvements to U.S. chemical policy, with a goal of developing and advocating practical solutions.

Minimizing Human Exposure

- *State purchasing* - The state's purchase of PBDE-containing products should be restricted in appropriate contracts, consistent with Executive Order 04-01.
- *General public* - Health should develop methods and materials for educating the public on how to minimize exposure to PBDEs. (Health has already completed two educational brochures, and both Ecology and Health have created PBDE websites.)
- *Occupational exposure* –
    - The state department of Labor and Industries (L&I) should develop and communicate ways for employers and employees to minimize exposure to PBDE-containing dust using standard industrial hygiene controls.
    - Health and L&I should continue to investigate the feasibility of implementing a workplace exposure study in collaboration with the Centers for Disease Control and Prevention (CDC).

Monitoring and Research

- *Human health monitoring* –
    - Health should explore biomonitoring for PBDEs and alternatives.
    - Health and L&I should coordinate with CDC on existing national biomonitoring of PBDEs.
- *Environmental monitoring* – Ecology should develop a monitoring program for PBDEs in the environment.
- *Research* – Ecology and Health should track and encourage other government agencies and research institutions to conduct research on:
    - Deca debromination
    - Fate of PBDEs in landfills
    - Establish baseline for non-brominated alternatives to PBDEs to assist future studies

- Product redesign
- PBDE exposure pathways

Incentives

- If safer alternatives are not identified, Ecology and Health should explore incentives to encourage manufacturers to develop safer alternatives and product design changes that eliminate the need for PBDEs. Carol added that this recommendation is new to the plan.

Carol reminded the committee that all of these recommendations will be in the final PBDE CAP, and that the CAP is for all PBDEs, not just Deca. Carol then reviewed the next steps for the final PBDE CAP:

- Complete the PBDE CAP by December 2005. (The 30-day public comment period began December 1, 2005.)
- Develop End-of-Life recommendations, using a newly established Advisory Committee.
- Implement PBDE CAP recommendations as funding allows.

Advisory committee members had the following comments and questions on the final PBDE CAP recommendations:

- **Difficulty in securing participants for occupational exposure studies.** An L&I representative mentioned that he has started to work on occupational exposure studies. Studies are dependent on voluntary participation from businesses. L&I has run into concern about confidentiality, legality, etc. Legal issues in particular revolve around concern that workers will have access to health data that they could potentially use for lawsuits. With reason, people are hesitant to participate in studies.
- **Recommendation to conduct testing in prisons.** A committee member recommended that L&I look into California's Atwater prison where a computer recycling program has been implemented with inmates as the workers. The member thought that L&I could have access to some blood testing data that has been done on prisoners without having names attached. Washington State electronic equipment is in the prison. L&I responded that there are ethical issues to consider when working with prison populations, but that it was a good suggestion.
- **What populations should Ecology and Health be looking at in their occupational exposure studies?** One committee member asked if Ecology and Health would be studying additional workplace exposures, not just those populations who work in the manufacturing process. Health responded that they want to find the sector of the population that has the highest exposure, which might mean those who work in the manufacturing process. L&I responded that they have to find a worker population and a control population with identical demographics.
- **Do not duplicate biomonitoring efforts.** Health commented that they want to make sure they are not duplicating any national or state biomonitoring efforts. The CDC is already addressing PBDEs through its National Health and Nutrition Examination Survey (NHANES). Health needs to make sure they coordinate efforts and find a useful biomonitoring niche for Washington State.
- **Research on crawling children.** One committee member asked if Ecology and Health have considered testing families with younger children who crawl versus older children who do not. She stated that some research has shown evidence of higher exposure of PBDEs in crawling children. Health responded that they definitely want to explore that pathway.
- **Environmental monitoring already underway.** Ecology explained that they have already begun environmental monitoring. They have devices (i.e. semipermeable

membrane device) in Washington State lakes that mimic bioaccumulation as part of a long-term research plan. The sampling plan has a completion date of June 2006.
- **What is the timeframe for implementing the PBDE CAP?** Carol responded that Ecology and Health will know more about a timeframe once the CAP is finalized. They would like to be done with the EOL stakeholder component by June 2006.

The facilitator opened the floor to all committee members and additional stakeholders for any last comments and/or questions:
- **Stability and recyclability of polymers such as Deca.** An additional stakeholder commented that all polymer additives, such as Deca, are going to be persistent, which means they are going to be detected somewhere at sometime. The industry refers to this level of persistence as "stability," which is a good feature and means the polymer is doing its job. Health asked the stakeholder if she would classify RDP as mechanically recyclable as Deca. The stakeholder responded that she thinks Deca, and PBDEs in general, are much more recyclable than alternatives. Health asked if RDP is usable in HIPS/PPO. The stakeholder responded that RDP is usable in HIPS/PPO and that she is not sure of RDP's recyclability. Health commented that recyclability is important when considering Deca alternatives.

Debrief & Wrap Up

Marc Daudon thanked everyone for their input and explained that the Deca alternatives advisory committee process had now come to an end. He welcomed feedback from everyone to Ecology, Health, and to himself. Marc explained that he would check-in with each committee member in the next few weeks to get comments on the advisory committee process.

Carol Kraege also thanked everyone for their participation. Ecology and Health sincerely appreciate the time and energy everyone put into this process; their collective feedback was extremely valuable.

Carol explained that members would see the PBDE CAP draft in their emails a week or so following this meeting, and it would also appear on the website.

*Attachments can be found on Ecology's website or obtained by email from Mike Gallagher (mgal461@ecy.wa.gov).

Meeting Adjourned